Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-28 (Canceled)

29. (Currently Amended) The method according to claim 39 ~~28~~, wherein the plant nonsymbiotic hemoglobin is barley nonsymbiotic hemoglobin.

30. (Currently Amended) The method according to claim 39 ~~28~~, wherein the plant exhibits improved ~~agronomic properties include~~ germination under hypoxic conditions, as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

31. (Currently Amended) The method according to claim 39 ~~28~~, wherein the plant exhibits improved ~~agronomic properties include~~ seedling vigour under hypoxic conditions, as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

32. (Currently Amended) The method according to claim 39 ~~28~~, wherein the plant exhibits ~~improved agronomic properties include~~ reduced cellular levels of fermentation products under hypoxic conditions, as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

33. (Currently Amended) The method according to claim 39 ~~28~~, wherein the plant exhibits ~~improved agronomic properties include~~ increased oxygen uptake under hypoxic conditions, as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

Claims 34-38 (Canceled)

39. (New) A method of increasing a plant's tolerance to hypoxic conditions, comprising transforming a plant with an expression system comprising a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin, wherein the plant exhibits increased tolerance to hypoxic conditions as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

40. (New) The method according to claim 39, wherein the hypoxic conditions are related to one or more conditions selected from the group consisting of ice encasement, flood, and impacted soil.

41. (New) The method according to claim 39, wherein the plant exhibits increased ability to maintain cellular metabolism under hypoxic conditions, as compared to a plant that has not been transformed with a nucleic acid molecule encoding a plant nonsymbiotic hemoglobin.

42. (New) The method of claim 39, wherein the expression system further comprises a control sequence operably linked to said nucleic acid molecule.

43. (New) The method of claim 42, wherein the control sequence is a strong constitutive promoter.

44. (New) The method of claim 42, wherein the control sequence is a host-specific promoter.

45. (New) The method of claim 39, wherein the plant nonsymbiotic hemoglobin is a rice nonsymbiotic hemoglobin.

46. (New) The method of claim 39, wherein the plant nonsymbiotic hemoglobin is an Arabidopsis nonsymbiotic hemoglobin.

47. (New) The method of claim 39, wherein the plant nonsymbiotic hemoglobin is a maize nonsymbiotic hemoglobin.

48. (New) The method of claim 39, wherein the plant is a maize plant.

49. (New) The method of claim 48, wherein the expression system further comprises a maize ubiquitin promoter.

50. (New) The method of claim 39, wherein the expression system further comprises a selectable marker.

51. (New) A plant made to have increased tolerance to hypoxic conditions in accordance with the method of claim 39.

52. (New) The plant of claim 51, wherein the plant expresses plant nonsymbiotic hemoglobin at an elevated level under hypoxic conditions as compared to a plant that has not been transformed with an expression system comprising a nucleic acid molecule expressing a plant nonsymbiotic hemoglobin.

53. (New) The plant of claim 53, wherein the plant expresses plant nonsymbiotic hemoglobin under hypoxic conditions at a level ten times higher than that of a plant that has not been transformed with an expression system comprising a nucleic acid molecule expressing a plant nonsymbiotic hemoglobin.

54. (New) A method of determining if a seed is germinating, comprising:

providing a seed;

isolating an extract from the seed;

measuring the level of expression of nonsymbiotic hemoglobin within the extract; and

correlating the level of nonsymbiotic hemoglobin expression with germination, wherein germination is indicated by a high level of nonsymbiotic hemoglobin expression as compared to a level of nonsymbiotic hemoglobin expression in an extract of a seed that is not undergoing germination.

55. (New) The method according to claim 54, wherein the seed is selected from the group consisting of seed from barley, maize, wheat, wild oat and *Echinochloa crus galli*.

56. (New) The method according to claim 54, where the measuring step comprises determining the amount of nonsymbiotic hemoglobin protein in the extract.

57. (New) The method according to claim 54, where the measuring step comprises determining the amount of nonsymbiotic hemoglobin mRNA in the extract.

58. (New) The method according to claim 54, wherein the seed undergoes imbibition, and wherein the isolating step occurs after the start of imbibition.

59. (New) The method according to claim 58, wherein the isolating step occurs within eight hours of the start of imbibition.

60. (New) The method according to claim 58, wherein the isolating step occurs within three days of the start of imbibition.